W-A1 Algebra 1 Week 30 5/1

slope

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$(3, 2)$ $(-5, 12)$

x_1, y_1 x_2, y_2

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{12 - 2}{-5 - 3} = \frac{10 \div 2}{-8 \div 2} = -\frac{5}{4}$$

$\frac{-5}{4} \longrightarrow \frac{\text{down } 5}{4 \text{ right}}$

$(-4, 3)$, $(2, -9)$ Find slope

$$\frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-9 - 3}{2 - (-4)} = \frac{-12}{2 + 4} = \frac{-12}{6} = \boxed{-2}$$

Slope – Intercept form

m b

$y = mx + b$

$[m = \text{slope} = \frac{3}{2}]$

$y\text{-int} = \underline{b} = \underline{6}$

$\boxed{y = \frac{3}{2}x + 6}$

$m = \frac{-8}{9}$ $\qquad y = mx + b$

$y\text{-int} = -3 = b$ $\qquad y = \frac{-8}{9}x - 3$

$(-1, 7)$ $(3, -5)$ Find the equation for the line through those two points.

1.) Find slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5-7}{3-(-1)} = \frac{-5-7}{3+1} = \frac{-12}{4} = -3$$

$m = -3$

2.) Use slope-intercept

Use pt $(-1, 7)$

$x = -1$

$y = 7$

$y = mx + b$

$7 = (-3)(-1) + b$

$7 = 3 + b$

$-3 \quad -3$

$4 = b$

$y = -3x + 4$

Use point-slope

Use pt $(-1, 7)$

$y - y_1 = m(x - x_1)$

$y - 7 = -3(x - (-1))$

$y - 7 = -3(x + 1)$

$y - 7 = -3x - 3$

$+7 \quad +7$

$y = -3x + 4$

(-2, 9) (6, 5) Find the equation.

1.) Find slope.

$$\text{slope} = \frac{9-5}{-2-6} = \frac{4}{-8} = -\frac{1}{2}$$

$m = -\frac{1}{2}$

2.) $y = mx + b$

(6, 5) $5 = -\frac{1}{2}(6) + b$

$5 = -3 + b$

$+3 \quad +3$

$8 = b$

$y = mx + b$

$y = -\frac{1}{2}x + 8$

$y - y_1 = m(x - x_1)$

(-2, 9) $y = mx + b$

$9 = -\frac{1}{2}(-2) + b$

$9 = 1 + b$

$-1 \quad -1$

$8 = b$

$y = -\frac{1}{2}x + 8$

Standard form

$$Ax + By = C$$

$2x + 3y = 6$

Scenario #1

"I hate you, Nate. I'm using slope-intercept"

$2x + 3y = 6$

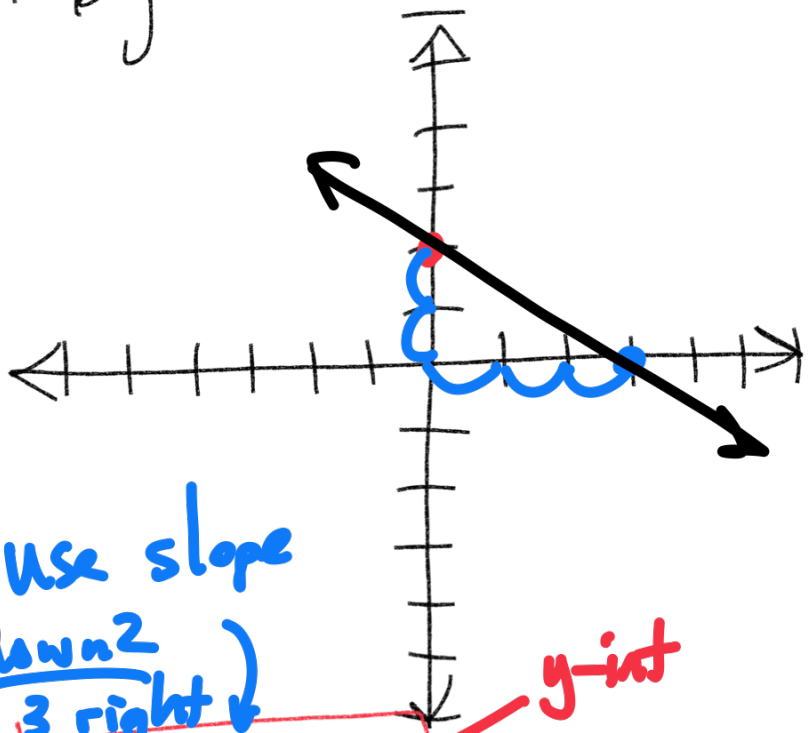
$-2x \qquad -2x$

$\frac{3y}{3} = \frac{-2x}{3} + \frac{6}{3}$

$y = \frac{-2}{3}x + 2$ slope-intercept

use slope down 2 3 right

y-int



Graphing the intercepts

$2x + 3y = 6$

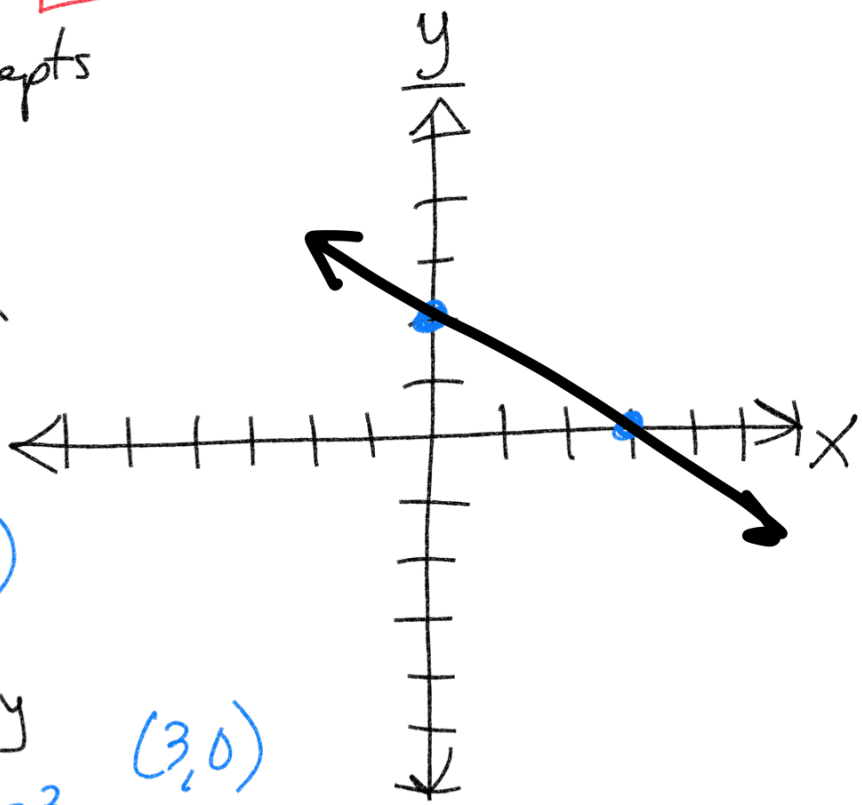
y-int $x = 0$ Kill x

$\frac{2x}{2} + \frac{3y}{3} = \frac{6}{3}$ (0,2)

$y = 2$

x-int $y = 0$ kill y

$\frac{2x}{2} + \frac{3y}{3} = \frac{6}{2}$ $x = 3$ (3,0)

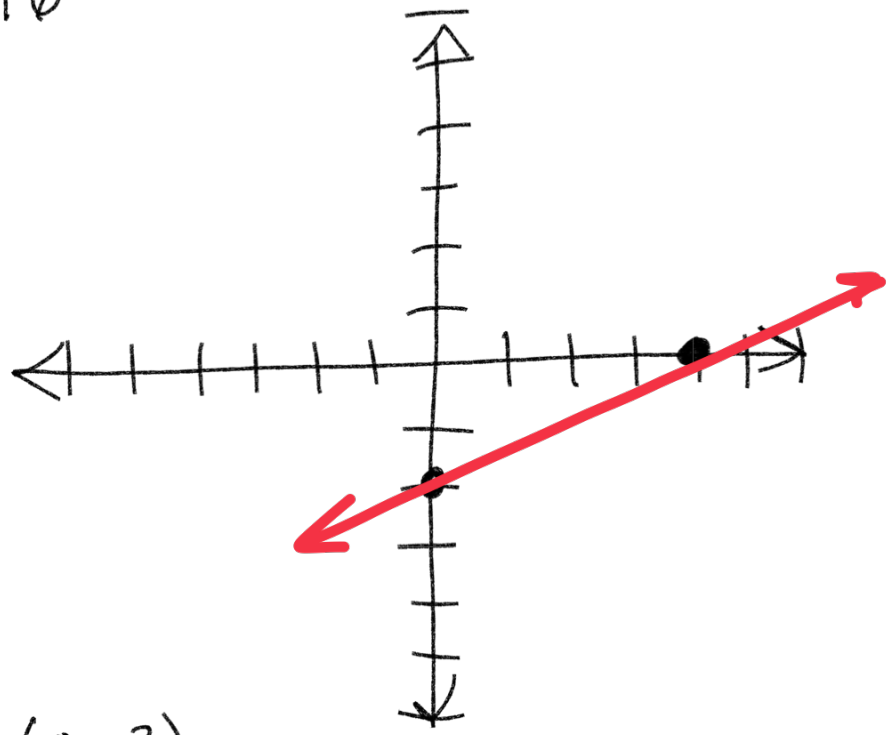


$4x - 8y = 16$

$4x - \cancel{8y}^{0} = 16$

$y = 0$

$\frac{4x}{4} = \frac{16}{4}$ $x = 4$ $(4, 0)$



$\cancel{4x}^{0} - 8y = 16$

$x = 0$ $(0, -2)$

$\frac{-8y}{-8} = \frac{16}{-8}$

$y = -2$

$-8x + 6y = 24$

$x = 0$ $(0, 4)$

$\frac{\cancel{-8x}}{\cancel{6}} + \frac{6y}{6} = \frac{24}{6}$

$y = 4$

$y = 0$ $(-3, 0)$

$-8x \cancel{+ 6y} = 24$

$\frac{-8x}{-8} = \frac{24}{-8}$

$x = -3$